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Is Information Systems a Science?

Neil McBride
Centre for Computing and Social Responsibility
De Montfort University
nkm@dmu.ac.uk

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Is Information Systems a Science?

Neil McBride
Centre for Computing and Social Responsibility
De Montfort University
nkm@dmu.ac.uk

Abstract:

The information systems discipline has been compared with the physical and biological sciences, suggesting that information systems sits in the same academic space as physical and natural sciences. This suggestion supported by the language and perception expressed in journals such as the Transactions for Replication Research, which refer to "scientific consensus" and the involvement of information systems researchers in "the quest for scientific advancement". This paper suggests that the view that information systems is a science in which general laws can be developed through the application of statistical surveys, laboratory experiments run and expressed as mathematical equations has negatively affected the development of information systems. It is argued that the nature of information systems is such that it cannot be pitched as a science. Following a brief discussion of the motivation and philosophy that might underlie the perception of information systems as a science, an alternative view of information systems is offered as a deep, complex and multi-layered discipline within the humanities. Dance studies is proposed as an appropriate discipline to twin with information systems. The paper ends with a call for the remobilizing of information systems, the positioning of information systems as a social humanity.

Keywords: Information Systems Discipline, Science and Humanities, Dance Studies

1 Introduction

Large statistical studies, extensive tables of numbers presented to three decimal places, accretions of influence diagrams built to ever-increasing levels of complexity, hypotheses supported or refuted by number-crunching, and quests for independent variables: such are the characteristics of much of published information systems research. Several recent studies confirm the convergence of information systems on a limited range of topics and a predominance of particular methodologies. Does this represent a maturing of a discipline or a stagnating of a discipline? Palvia et al (2015) suggest that, "while many things have changed, much has remained the same in conducting IS research. Perhaps the IS researcher is slow to change and an introspection is clearly in order." I would suggest that it is time to reignite the debate on the nature of information systems research and the underlying philosophy that drives information systems researchers. While environmental influences such as the demands of PhD students and the rigors of tenure may influence the evolution of information system research (see McBride, 2017), I would suggest that the malaise in information systems derives from much deeper philosophical concern about the nature of humanity and society which underlies the view that information systems can be treated as a science.

Stein et al's recent study of information system trends as represented in the ECIS conferences of the last ten years suggests that information system academia has drifted into a cul-de-sac (Stein et al, 2016). Far from bringing leading-edge ideas, insights and wisdom to academics and practitioners across management and technology disciplines, information systems has become a side subject concerning technology adoption. Stein et al (2016) illustrated the predomination of positivist frameworks such as TAM, and the reluctance to pursue new avenues and take a systemic view of information systems as enshrined in the discipline's title.

It looks as if the discipline has retreated to the apparent safety of pure positivist statistical techniques. Case studies, reflection, creative qualitative research has been side lined. In pursuing this certainty and safety we observe a predominance of statistical studies. PhDs are considered valid if they identify hypotheses, run surveys and process data through a statistical system such as Amos. A concern with techniques such as structural equational modelling results in the discussions of conclusions based on levels of statistical significance which would probably be questioned by professional statisticians. Frequently the validity of qualitative research is only accepted if the data has been appropriately processed through software to give it a positivist veneer and support the expression of numerical data derived from the field work.

Has the information system community abandoned its responsibility to be thought leaders, to question and reflect on information systems practice, to draw on concepts from a range of disciplines, to establish new understanding and new methodological directions? Has it abandoned engagement and dialogue with practice and with other disciplines in the pursuit of a scientific purism which is neither useful to practitioners nor philosophically justifiable?

Lui et al's study of information systems themes (Lui et al, 2016) covered by the major information systems journals over 20 years illustrates the convergence towards the field on technology adoption and acceptance. Furthermore, their study shows that adoption/ acceptance, usage and TAM form the motor theme of information systems research across 20 years of information systems research. Lui et al point to the domination of TAM-related research in information systems. TAM has invaded 16 new application areas in the last decade. Lui at al (2016) identify a cohesion of information research towards technology adoption. This is not a healthy evolution of information systems, rather it is a contraction into safety of side waters, avoiding negotiating the rapids of technological and social change. Our discipline seems to be trapped by a thematic myopia and a methodological conservatism.

Palvia et al's (2015) meta-analysis of 2487 papers from 2004 to 2013 confirm a methodological dependence on surveys and laboratory 'experiments' accounting together for 36.4% of all papers, and mathematical modelling accounting for 7.5%. Multi-tier influence models, of which TAM is a prime example, dominate and positivist approaches account for 72.3% of papers. TAM studies pander to the illusion of scientific accuracy, and fail to address the complex social, political and economic forces that encompasses technology acceptance in the real world. And any value of TAM studies lies in the interpretative leap made to insightful and valuable interpretive commentary (Elbeltagi et al, 2005, McBride, 2007).

Lui et al (2016) present in their study the evolution of a field which maps a contraction to a point, rather than an expansion to match the diversification of information system and practice in the real world. Significantly, when it comes to comparing the progression of information systems with that of other disciplines, Lui at el choose example disciplines, which might be defined as hard science, including stem cell research and psychophysiology. In comparing information systems to 'well-established scientific disciplines such as psychology' (Lui et al, 2016 p 21) there is an underpinning assumption that information systems is a science, a study of deterministic, natural phenomena that can be measured and theorized in the same way as environmental ecology or quantum physics.

Dennis and Valacich (2014) take this much further. In their introduction to the journal Transactions of Replication Research, they are explicit about the equivalence of information system as a discipline and the physical science. Replication of experiments may be expected when dealing with physical sciences, but are we deluded to expect such replication in the field of information systems where 'the object of study, humans, have free will and a diversity of automatic subconscious responses.'? Dennis and Valacich admit that social science differs from the natural science where chemical reactions are precisely reproducible under the same laboratory conditions, and yet they express an expectation that information system research can be replicated, providing scientific validation. Does the presence of automatic subconscious responses suggest that free will is not really operating? Depending on their philosophy of free will, are they suggesting that social phenomena are deterministic, and reproducible in a manner that is open to the scientific method? Dennis and Valacich (2014) are clearly expounding an underlying viewpoint that information systems is a science: replication 'enables scientific consensus' , 'validation is crucial to the advancement of science' ,'Either outcome will advance science' and 'we call on our colleagues to join us in this quest for scientific advancement'.

I will argue, that the positioning of the discipline of information systems as a science has damaged it both academically and practically and that the view that information systems is a science is unsustainable. I will briefly consider the debate in the past about the nature of information system as a discipline and offer a new disciplinary model of information systems. If information systems is to survive as a discipline there needs to be a repositioning of it both academically and practically.

2 Consequences of Treating Information Systems as a Science

The presence of an underlying deterministic philosophy of information systems results in a type of research that favors numbers over words and concepts, which reifies the scientific hypothesis and expects reproducible cause and effect. It may equate the presence of statistical results and mathematical expressions with truth, robustness and reliability. It sets the expectation that a conclusion is correct because it is based on numerical analysis. It excludes interpretation and judgement as an element of research and takes a theory, concepts or cause and effect linkage as something out there, objective, fixed and waiting to be discovered by an objective and detached researcher.

Many information systems studies are heavy on data analysis and light on theoretical depth. A recent study by Kehr et al (2015), applying privacy calculus, selected sets of participants from two countries, the United States and Germany. Participants completed an initial questionnaire and were introduced to variants of a mobile application that would monitor driver behavior using either lowly or highly sensitive personal data. Participants then completed a questionnaire driven by the researchers' quantitative model. The authors' fairly obvious conclusions were that people's rational evaluation of a situation was affected by how they felt and that people made decisions based on the specific situation, rather than based on generally held attitudes. These were rendered of practical significance by the ethically naïve statement that 'simple manipulation of affective content may be sufficient to override [privacy] concerns' (Kehr et al, 2015, p627), in a study partially supported by a Swiss insurance company.

In another recent study, Scott et al (2016) drew on DeLone and McLean's IS success model, another framework which has dominated information systems research. Despite the orthodoxy of the framework, Scott et al immediately open with admissions that there is little consensus on the appropriate measures for IS success, there is a lack of development in measuring specific dimensions of IS success and there is a tendency to utilize user satisfaction as a surrogate for IS success. Their study of e-government success is quickly constrained to the study of user satisfaction within the boundary of technology adoption. Eleven constructs, thirty items and a homogenous population of university staff and students are presented as the basis for analyzing e-government success. A key construct concerning control which might have exposed, at least in part, the complex control and power relationships between citizen and state is dropped. IS

success is reduced to a kind of limited user satisfaction. The simplification is so severe that the results say little about the complex interactions that render an information system successful. Even from its limited point of view, critical elements are omitted. In the narrow focus on net benefit, there is no reference to task and purpose. Dimensions of cost, time, convenience, and personalization are of no relevance if I cannot complete my task and achieve the purpose I logged on for. I do not use the UK DVLA website to license my car because I value information retrieval, but because I must use it to avoid fines. And the success of that site lies in the quality of design of the business process and the clarity and simplicity by which it guides me through the business process. It is also underpinned by the seamless integration of information sources whose complexity is hidden from the user. Furthermore, critical issues such as security, reliability, and support which must affect e-Government success from the user's point of view are ignored. The focus on user satisfaction ignores the much more extensive, systemic nature of IS success. Power, politics, regulation, culture, media presentation, technology, government relationship to industry, international markets, approaches to project management, the development of industry standards and many more factors play a much larger role in information system success than the view of university students concerning whether they can use an e-government website round-the-clock. The effect of such a study is to mask the complexity of the information systems discipline and limit the practical use of such research.

A recent study by Sollner et al (2016) further illustrates the consequences of treating IS as a science. Firstly, the conclusions are obvious. In a study which applied Trust-TAM to investigate the user's trust of four parties (information systems, provider, Internet, Community of Internet Users) on the use of a simulated meeting arranging system, the authors conclude that trust in the provider of the IS influences intention to use; trust in the IS is a major driver of IS use and trust in the provider is more important than trust in the IS. A complex structural equation modelling study is not required to come to these conclusions. The study makes no attempt to understand the different characteristics of the artefacts (information systems and internet) and the social actors (Providers and Communities). Perhaps this is underpinned by the philosophy of information systems reflected in actor-network theory. The study has airbrushed out the difference between things and people and ignored the possibility that trust is a property of a relationship between two social entities and that the information system functions as a mediator between the two human groups as a basis for negotiating and expressing trust. Secondly, the advice to practitioners is superficial and little related to the study. It may be the case that in many studies it is very difficult to transition from the academic to the practical. In this study, advice to take measures to demonstrate ability, benevolence and integrity offers little, as the authors admit. Thirdly, the veneer of objectivity so often presumed in such positivist studies peels off all too easily. The participants are students, the researchers are academics at the same institution and the providers of the IS are the academics. The observer is the provider and a partner in the trust relationship. A strong trust relationship has already been established before any experiment is conducted and it is no wonder that the significance of provider trust constructs is as high as sixty times greater than any other.

But such paucity of theory and insight in not limited to positivist studies: it has spread to qualitative studies. Consider Cunha et al's (2015) study of the deployment of a customer relationship management system in a communication company. The researcher conducted a rich longitudinal case study, involving a massive base of fieldwork including 307 days of observation, attendance and transcription of 51 teams meetings and the gathering of 3000 pages of documentation. It is clear from the published work that the study offers extraordinary opportunities for interpretation, for the development of narratives, for the identification of creative insights. And yet a conformance to a scientific or pseudo-scientific paradigm demands an attempt to appear scientific through data reduction, open coding and categorization. In pursuing the veneer of objectivity offered by a grounded-theory-like approach huge reservoirs of interpretive insights are drained in favor of a weak conclusion concerning the loose-coupling of work with its representation. Their practical conclusion that 'managers… need to anchor the design and implementation of information systems on the work practices that employees actually use in their everyday work' (Cunha et al, 2015, p343) is not only of limited value to practitioners, but fails to understand the complex role of information systems in organizations.

Laboratory experiments may give the impression that a complex social phenomenon is being isolated as in the same way a physical variable might be in, say, experiments with light. For example, Brown et al's (2016) study on email style and impression formation not only reifies complex literary styles in emails as the independent variable of email style and dependent variables of social and task competence. It also furthers the illusion of a science by attempting to isolate the social phenomena as laboratory experiments. The variables are interpretive variables cast as objective variables. Can email style really be measured and defined in the same was a sugar concentration in cells or variation in an mRNA population? The use

of a laboratory situation gives a false sense of comfort that something social is isolated and can be examined under controlled conditions. Additionally, it should be noted, laboratories are social environment, adding further layers of social complexity.

But the creation of laboratory experiments is only one way in which information systems build an illusion of scientific activity and accuracy in what are really immeasurable, social and interpreted phenomena. Another approach to creating a veneer of scientific accuracy is in the use of mathematical models to represent what is a highly subjective phenomena as mathematical rules and structures implicitly parallel to the equations which might drive quantum physics. Hence the social phenomenon is rendered equivalent to a physical phenomenon in what is clearly a category error.

Machado et al's (2017) mathematical modelling is clearly an example of the attempt to render a social phenomenon as science. The theoretical models are self-referentially validated through simulations with no attempt to relate them to reality. Mathematical models and simulations of social and economic phenomena are notoriously unreliable. Even engineering simulations of, for example, robot structures and swarm robots fail when attempts are made to translate them into real-world engineering products. Pursuing mathematical models in information systems is only another attempt to pretend that information systems is no different from rigorous physical sciences and the study of physical phenomena such as light, sound and electricity. Nelson (2016) comments that even mathematical models should be regarded as allegories that help thinking. But this is not where information systems takes them. Rather, as illustrated by Machado et al's (2017) work, these models of complex social phenomenon are treated as if stable laws are being identified which can lead to 'scientifically'-based strategy. Nothing could be further from the truth.

3 Why Information Systems is Not a Science

The rhetoric of information systems as a science producing scientific paper points to the illusion that the behavioral and social sciences can be treated with the same instruments and viewed as phenomenologically the same as the physical sciences which have straightforward quantitative specification, mathematical sharpness and precision of causal explanation (Nelson, 2016). They cannot. The nature of reductionist science requires constraints, simplification and the managing of the environment within which the phenomenon is being studied.

I can take a single species of green algae, split a culture in two, grown in the same light conditions with same media. I can cover one culture with cooking foil. The culture in the dark switches a majority of its protein synthesis to the production of one enzyme, isocitrate lyase (McBride and Thurston, 1983), which I can measure and describe both in terms of protein and messenger ribonucleic acid (mRNA) populations. This science cannot be compared to a study of 487 students' guilt reactions to thinking about discontinuing the use of a social networking site (Turel, 2016). To equate such a study with sciences, as if its methods and outcomes align with those of the physical science is clearly a category error. Fear, shame and guilt cannot be measured in the same way as shifts in RNA populations could be measured. What do people mean by good or bad? What is the difference between very slight guilt and extreme guilt?

Lui et al (2016) in examining the distinctiveness of information systems, title a section 'Distinctive IS research a comparison with other scientific fields" (Lui et al, 2016, p14). They compare information systems with psychology, behavioral research, the study of environmental acidification, software engineering, and even more inappropriately stem cell research.

Stem cells are unspecialized cells which can multiply and flourish as a population for a significant time. They are cell lines which can be maintained in the laboratory. They can be well characterized, confined and isolated. A well-understood boundary of study can be erected around them. Their function can be understood in physiological and biochemical terms. Metabolic pathways can be traced. Biochemical phenomena can be isolated and controlled in such a way that one step can be studied through the manipulation of one element of a biochemical pathway. Stems cells can be uniquely induced to differentiate by altering a limited number of parameters and maintaining complete control of the chemical environment they exist in. Such are the constraints we can apply to stem cells that we can eliminate any extraneous effects on the manipulation of the biology of stem cells. Stem cells are homogenous: every cell has the same characteristics. Their interactions are predictable. They do not vary in complex ways. The do not have free will. They do not counter or resist the scientific manipulation. They do not have language; they do not take multiple different interpretations of their environment; they do not argue; they do not walk

out of their petri dishes; they do not form unpredictable political alliances. Thus, the comparison of the science of stem cells with the 'science' of information systems makes no sense.

Conducting science requires quantification (although in fact much of the output of science is presented as narratives and stories developed from an interpretation of the numbers). We must identify or create measurables, measure and identify trends and measure changes. The parameter selected must be appropriate and represent the phenomenon in a reliable way which is accepted by scientific consensus. The selection of the indicators, the quantity to be measured is clearly a result of interpretation by the scientist. The measurable is, as far as we can tell, a real physical effect. We can measure the amount of isocitrate lyase, the density of DNA bands on a gel, electrical potential and so on. There is no or at least a minimal gap between the natural phenomena and the change being measured. Our laboratory work may simplify the complex systems. But we simplify things in order to make the system measurable. In the case of Chlorella the complexity of algal respiration is reduced by in essence placing a mask over the algae so that the only change is whether the plant is in the light or the dark and the only measurable is the amount of isocitrate lyase. This simplification creates manageable quantification and a focus on one aspect of the system.

In a social system the complexity of the system is in the order of magnitude greater and the extent of controllability is greatly reduced. Not only does it become essentially impossible to limit the variable changes, also the distance between the actual change and what we 'measure' becomes unsustainably immense.

In such 'social science experiments"; we must question whether the selected measurable actually represent anything of value in the real social situations. Proxy variables which we take to indicate some significant phenomenon, are separated from the phenomenon by some unknown distance and unknown intermediary influences. There are no direct measures. The proxies are invented and may have little connection with the real world. Indeed, Nelson (2016) suggests, "there are strong reasons to be cautious about the extent to which these proxies or indicators really provide illuminating counts or measures of the variables they purport to quantify."

Many concepts pursued in information systems, like trust, guilt, anxiety, are vague, subjective and variable. Meanings will vary according to subject, context and a host of other interacting influence. Even perceived ease of use and perceived usefulness will be highly contextual and individual, affected by prejudice, feelings and state of health. And just defining a three-letter acronym, allocating a set of numbers and providing a Cronbach's Alpha is seen as a justification for labelling the research as 'science', equivalent to Simon's modelling of 'friendliness' as differential calculus equations, camouflaged by quantification (Andreski, 1972, p136).

Complexity and heterogeneity are ignored. Like studying an elephant in the room, we obsess about the toenail and ignore the head, brain and threatening tusks. We cling to an illusion of objectivity in our statistical and laboratory studies. Even in the most rigorous scientific experiment, there is a certain subjectivity in the selections of variables and the conclusions drawn by the scientist. In the social situation, all is subjective. The researcher is a social being, acting in the situation. In the laboratory situation, the influence of the researcher, particularly when he is the research subject's professor is immense.

Furthermore, what is not selected as a variable, what is excluded, is just as important, just as much an interpretation, just as likely to be a result of prejudices and personal opinion as what is selected. We see what we want to see. Our questions may be the wrong questions because of our social expectations. Complex factors may be ignored or side-stepped. Really exploring the complex networks of interactions which drive the relationship between organizations and information systems is inconveniently messy. Culture, for example, with its layering of interactions: the political, the social, the religious, the historical, is much easier purified to Hofstede's six dimensions of national culture which offer the safety of easy measurement. In any quantitative study, the exclusions must raise questions about the validity of the limited set of variables selected.

4 The Quantitative Motivation for Information Systems Research

I would suggest that much of information systems research lacks both descriptive and predictive power. Social sciences are predictively weak and do not turn out law-like generalizations. Indeed, quantitative concentration on formal hypothesis, so-called testable, strip out rich insights and render colorful phenomena in black and white.

MacIntyre, in After Virtue (1981, p94) notes that for much social science, counter examples can co-exist without any refutation, a situation which would be unacceptable in the physical sciences which disciplines such as information systems seek to emulate. Furthermore, replication is an impossibility in most social and behavior science. Even in the so-called 'laboratory conditions', it cannot be demonstrated that information systems hypothesis would hold in all circumstances. There are no universal quantifiers. There are no clearly defined scope and boundaries. Much information systems phenomena is contingent, infinitely variable, a result of complex, systemic interactions which create unique conditions in every organization, unique individual behaviors and an infinite range of relationships mediated by information systems.

If there is a science of human behavior, which is what some information systems researchers seem to be pursuing, it would need to omit all reference to intention, purpose and reason (MacIntyre, 1981, p83), because such quantitative research would be examining deterministic cause and effect phenomena, natural interactions devoid of human free will and without purpose. Scientific fact must be value free but in information systems it is not. As such, information systems researchers try to create an edifice of intention and purpose which is unsustainable and must inevitably crash to the ground.

What underpins the ideology of information systems as science is a materialism which views quarks, genes, organizations and social systems as one and the same thing; driven by laws which are out there, waiting to be found; a world in which every interaction is reducible: the acceptance of technology becomes an interaction of atoms. It is a world where there is one view, one lens, one method of explanation; a world underpinned by a physical theory of everything which explains all phenomena from Valentine's Day to vacuums. If mathematics can describe Higg's Boson, why can't mathematics describe IBM's IT outsourcing? Is there any difference between a population of gas molecules colliding in a jar and a population of warehouse men navigating round a warehouse and undermining the carefully constructed information systems?

Some information systems research seems to be driven by a kind of social atomism in which organizational interactions can be reduced to the determined behavior of individuals who can be subjected to questionnaires and laboratory experiments to derive an underlying scientific law which will apply to doctors in Ukraine and surfers in Sydney. Information systems aspires to be like physical sciences which aspires to be like mathematics such that the highest and most pure information systems model will be expressed in mathematical formulae. Abstraction is the prime aim (Midgley, 2002, p194). And that aim dissolves the human, the organizational, the social and leaves us with a bleached skeleton which is a far cry from the living breathing being and has lost more in description than would even be gained through 'science'.

As Midgley goes on to suggest, there are many maps (Midgely, 2002, p195), many ways of describing a social phenomenon. There are multiple levels of divergent explanation, multiple purposes, multiple angles of observation, multiple tools for observation. But a belief in scientism will drive us to express everything in numbers and to the conclusion that complex organizational systems are as measurable and reproducible as the speed of light.

Such a scientific positioning in information systems is unrealistic. It is safe and comforting to float in a (dead) sea of numbers and equations. We are simply drawing a physical conclusion, developing a law-like generalization which is out there, waiting to be discovered, for which I have no responsibility in interpreting and reflecting. The numbers say so, so there is no argument, no debate, no dangerous involvement of subjective and flawed humanity.

5 Remobilizing Information Systems Research

If information systems research is not the same as behavioral science research, if quantum physics and information systems are not sister disciplines, if the social and political complexities of the deployment of information systems in organizations and even their use by individuals defies quantification: where can we locate information systems, and how can such a relocation reinvigorate information systems research both in diversity and relevance?

Information systems involve movement and change. They support the development of organizational and individual behavior; they change activities and behavior. Information systems both impose meaning on human activity and reflect existing meaning. They are the vehicles for determining meaning, for collaborating in the complexities of society and organization.

I would suggest that information systems research would benefit from a return to the primacy of narrative. Even in the most concentrated quantitative studies, the value emerges in the narrative, in the resulting story. MacIntyre (1981) suggests that it is impossible to give an intelligible account of human actions outside the narrative mode. Explanations of the role and influence of information systems need to be developed as stories. We should start with description, with movement and progression of actions. Expressions of information systems phenomena may be better served by the development of thick descriptions (Denzin, 2001), or by pursuing literary genres. Avison et al's (2016) treatment of case studies drawing their structure from the French new novel provides a good example of the creation of a challenging approach to storytelling in information systems research. Other examples include the use of poetry (McBride, 2008) and radio plays (Stahl et al, 2014).

Not only should narrative be at the heart of presenting the information systems phenomena, but also in developing understanding and exploring context. Information systems research needs to return to the development of theoretical narratives, to exploring a wide range of theoretical artefacts (Alter, 2016) as a product of our research. Information systems researchers should pursue a wide range of approaches. Theories may provide frameworks, or scaffolding for exploring patterns, developing distilled concepts, and creating insights and understanding which can be reflected upon and fundamentally influence practice. We should bring to bear theories, ideas and conceptual frameworks not as material laws but as metaphors, supports for learning, tools for reflection and organizers of narrative structure. Information systems has been known for drawing on a wide range of disciplines both in the social sciences and beyond. The physics of quantum theory (McBride, 2006) chaos theory (McBride, 2005) and hierarchy theory (McBride, 2015) provide ways of creating coherent stories, providing insights and driving thinking.

Narratives offer an immersion, involvement and engagement with the world. They are a fundamental way of learning. They provide a platform for the discovery and documentation of wisdom. Storytelling transmits guidance, shapes the cumulative wisdom and enables the discovery and documentation of mature thinking and wise social involvement. Such narratives can be distilled into proverbs, guidelines, commentaries which encourage and enable wise behavior in difficult organizational situations.

It is not only the methodologies that need to be freed up in information systems research, but also the variety of disciplines which are drawn on. Remobilizing information systems will, for example, require an engagement with the past. Researchers should recognize the importance of history and seek to understand how past practice influences current information systems implementation. Design approaches should be traced. Pursuing narrative requires that we engage with the past, the life of the organization, the learning and prejudices of the users, the development of rituals, traditions, and context through the history of the individual or the organization. Quantitative surveys and laboratory experiments do not do this. They deny the past and create a permanent now.

There should be an engagement with philosophy and the developing of an understanding of the nature of information systems as addressed so well by the work of Beynon-Davis (Beynon-Davis, 2007). Additionally, there needs to be treatment of information systems as a political discipline, an exploration of both the macro and micro political environments and context which drive information systems and which has been skirted in a wide range of contexts, both organizational and national.

A reference or sister discipline for information systems cannot come from the physical sciences or even the biological sciences, however comforting that might be. It has to be more dangerous, complex, difficult to pin down, a fragile discipline in the humanities. I would suggest that the sister discipline of information systems is dance studies. Like information systems, dance studies is still relatively new. It has struggled to find its feet. It has been unmoored, homeless, alienated (Gierstof and Wong, 2016). Like information systems it is a complex accretion of disciplinary activities and practices.

At the core of dance studies are biological and physical facts about the human body its anatomy, mechanics and physiology. Patterns of dance and dance structure can be researched, analyzed and characterized. Dance can be considered in the context of its embedding in tradition and history. The study of dance must address the importance of culture, human interaction, human relationship and the social cohesion of society. It concerns a political involvement through the expression of new dance art forms and through commentary on politics, power and society (Mullis, 2015). It recognizes the creative force exerted through design, choreography, expression and creativity. It will involve the investigation of economic and business structure through government sponsorship, grants, commercial connections, television, film and other media. Business practices and methodologies concerned with the running of dance companies and associated commercial structures must be developed. Dance studies will have a strong educational

practice element conducted through dance schools and ballet schools. The daily social and domestic life expressed though local dance schools, certificates, dance taught in schools, dance as a part of social structure whether in ballroom dancing classes at the local adult education institutes, discos, clubs, or tea dances is clearly another research subject.

Dance studies is rooted in inquiry and process with an encouragement to ask questions and dig deeper, as should be the case in information systems studies. Courses in dance studies cover history, philosophy, anthropology, choreography and the ways in which dance shapes or is shaped by society. Taught dance techniques include both contemporary and novel styles as well as traditional ballet and a delving into the cultural tradition of dance in society. It also concerns the practicalities of theatre lighting, stage design and management, screen dance, and choreography as well as production and project management. Dance involves the learning of languages, the developing of meaning and communication through movement (Bannermann, 2014). It is inherently political (Mullis, 2015). This wide ranging, engaged, eclectic range of studies is parallel to what we should expect in information systems studies.

In dance history and tradition are united with innovation and the creation of new approaches. There are methods and practice to be learnt. An underpinning physical and material knowledge is required without which the body breaks and the performance fails. There is an expectation of practice and involvement, Dance must be seen in the streets, in schools, in public theatres. There is an engagement with the audience, and expectation of communication in the public space. Creativity is combined with good management practice.

So the practice and research of information systems is really the practice and research of dance, whether the formal dance of an organizational and transactional context or the free-flowing abandoned dance of social computing. I would argue that information systems is not a science and never has been. It is rather a humanity which resonates with human creativity, with the human state, with human relationships and contexts. The study of information systems is the study of the complex interactions and networks which bind together complex societies, and which enable economic activity both on a personal and global scale. The development of information systems is an engagement with creative arts. The practice of information systems is an engagement with human relationships, with the power and politics which enables the development of cities (McBride, 2013), the conduct of communities, societies and states.

The over-emphasis on quantification short-changes the human discipline of information systems. The underlying philosophy of determinism must be questioned. The idea that information systems is a science, repeated by Dennis and Valacich (2014) in referring to replications as advancing science, in calling for information systems colleagues to join a quest for scientific advancement encourages a myopic view of a living, dynamic discipline.

Information systems are complex emergent phenomena, that cannot be reduced or described in simple scientific formula. Imagine the inadequacy of reducing a dance to a description of a set of mechanical movements. And yet that it exactly what many do in information systems research.

Unless the information systems academic community grasps this, the discipline of information systems will continue to atrophy, to shrinking into a husk of TAM studies and introspective debates about the significance of minute statistical variation.

6 Epilogue

This is not a new problem. In 1997 Stowell and Mingers edited a volume entitled “Information Systems: An Emerging Discipline” in which a range of authors reflected on the state of information systems. Probert (1997) critiqued the essentialist, reductionist and epiphenomenalist fallacies which still plague information systems. Angell (1997) highlighted the significance of uncertainty and the centrality of power and control, areas which attract little attention from information systems researchers.

Less than ten years later, King and Lyytinen (2006) gathered papers and commentaries to chart the continuing crisis in the information systems discipline. Hirschheim and Klein (2006) in their contribution to the debate attribute the crisis in information systems to a fragmentation. This returns us Lui et al’s (2016) analysis which suggests a convergence towards technology adoption, TAM and positivist statistical studies. It is this apparent defragmentation of the discipline, which, ten years on in 2017, leads us into a new sea of stagnation, a lack of insight and irrelevancy. In our desperation to be established as a discipline, we have sacrificed the creativity and diversity which should characterize the study of complex human phenomena for the monotone regularity of surveys and statistical methods. Driven by the need for

legitimacy and acceptance, we have adopted the vocabulary and mindset of the physical sciences, something which is singularly inappropriate for the multi-dimensional study of the complex art which is information systems.

Information systems research has stagnated and requires nothing less than a remobilization. This remobilization requires a rejection of scientism and the parody of information systems as a science. It requires the positioning of information systems as a social humanity. It requires a promotion of storytelling, a diversification of modes of expression, a renewed engagement with practices, a widening of the means of dissemination, an explosion of creativity, and of the development of new concepts and new approaches. It requires a serious engagement with philosophy and history and an open and free discussion of philosophical positions. Most of all, I would suggest, it requires an articulation of the political dimension of information systems and an engagement with the power structures which information systems underpin.

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About the Authors

Neil McBride is a Reader in Information Management in the Centre for Computing and Social Responsibility at De Montfort University. He holds a PhD in Molecular Biology and has worked extensively in the information technology industry for over forty years. He is currently researching in privacy, the ethics of driverless cars and business intelligence. He has written on robot ethics, information systems ethics, chaos theory and information systems failures. His work has appeared in *Information Technology and People*, *IEEE Intelligent Systems*, *Information Systems Journal* and *Systems Research and Behavioural Science.*